

Q : State your name and business address?

A: Ronn J. Schuttie
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PO Box 47012
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Q: Where are you Employed and what is your Job Title?

A: Department of Natural Resources
Natural Resource Building, Olympia Washington
Forest Practice Division

Job Title: Natural Resource Forest Practice Operations Project Section Manager

Q: What is your Educational Background?

A: Bachelor of Science Degree in Forestry
*Graduated as a Forest Engineer in 1976
University of Washington, Seattle Washington

Q: Summarize your Professional Experience?

A: Forest Practice Program Field Operations - 11 years - 1987 to present:
Division contact for Forest Practices (FP) Rules, assisting region field personnel with rule and policy development and implementation. Provide technical assistance to the regions including issues with roads, drainage structures, surface erosion, and hydrology.

SW Region State Land Project/Sec Administrator and Regional Engineer - 5 years - 1979 to 1983 and 1997 to 1998:

Regional expert in all engineering related activities: roads (design and construction),

timber harvest, rock pits, drainage appraisals, right-of-ways, leases, survey cost shares, recreation, capital outlay projects, and disaster relief. Assist Regional State Land staff in Forest Engineering projects analyzing haul routes for environmental, Habitat Conservation Plan (HCP) and cost benefit considerations. Assist and train the unit field staff on technical/environmental road related considerations jointly developing solutions that meet program objectives.

Olympic Unit Forester - Quinault and Sollecks - 4 years - 1984 to 1987: Field engineer/forester responsible for timber harvest, road planning, recreation sites, special lands, fire control, forestry, and surface mined land reclamation.

Q: What is the subject matter of your testimony?

A: Road construction, road maintenance and site disturbance on state and private forest lands within Application No. 96-1. This testimony is not a substitute for site design. The concepts will apply to similar activities across all land uses. A digital computer can identify stream locations, wetlands, archeological/historical sites, land uses, and determine varying % slope breaks from a number of existing data layers to assist the reviewers in identifying specific sensitive sites.

Testimonial Components: The following testimony is based on professional experience, Forest Practice Rules and Regulations (WAC 222-22 & 24) and the science that supports watershed analysis.

In general, forest roads average approximately 4 miles of road per square mile of forest land across the landscape. These roads can increase sedimentation beyond one half the natural background level to surface waters and interrupt natural drainage patterns. This would be a significant impact to public resources (See WDFW, testimony on impacts to fisheries).

The Forest Practice Rules require roads to be constructed and maintained to levels that minimize erosion or are not conducive to accelerated erosion and maintain natural drainage patterns. The rule requires landowners to protect public resources from road related impacts [RCW 76.09.010(2)(b)]. I am considering the pipeline installation as site disturbance similar to that of stump and vegetation removal, occurring during temporary road construction. Upon final installation of those portions not underlying roads or trails open to continuing use, the pipeline corridor should be treated to reclamation procedures similar to those prescribed for abandoned roads in WAC 222-24-050 (5). Refer to other testimony by Lanny Quackenbush in defining Forest Practice Rule jurisdiction.

Q: What does the EIS say about roads?

A: No new access roads would be constructed or maintained for the proposed petroleum product pipeline. Existing roads would be used wherever possible. The width or quality of existing road beds would not be improved unless it became part of an agreement with the landowner. In the event that a closed road is temporarily opened for construction, it

would be closed upon completion of construction. Access via roads closed in winter would be via snowmobile. Existing open roads would remain open after construction was completed. (Stated on Page 2-19 under Access.)

Q: Will the above statement satisfy the Forest Practices Rules (WAC 222-24)?

A: No, existing roads can contribute significant (>10 tons per mile of road) amounts of sediment to streams and impact resources. Many existing roads met the rule requirements at the time of original construction and have not been improved to current Forest Practice Rule standards for hauling or forestry use today.

Q: Why is sedimentation of streams an adverse impact?

A: See WDFW testimony on impacts to fisheries. The following concepts can be used across all land uses. These concepts will apply to specific sites as they are identified within the project area.

Q: How does road construction including maintenance alter the landscape and impact resources?

A: Road construction alters the landscape to different degrees based on slope and existing drainage patterns. In areas where slope is relatively flat (less than 50%) and no natural drainage (streams) exists, construction has minimal resource impacts. In these areas attention still must be given to changes in natural drainage patterns from roads carrying ditch and road surface water for long distances (>300 feet). Density of roads (road per square mile of land) and proximity (location) to wildlife high use areas can cause

disturbance to upland wildlife.

Where construction or maintenance occurs on slopes over 50% and crosses natural drainages, Best Management Practices (BMP's) are required (See Chapter 222-24 WAC, the Forest Practice Illustrated publication, exhibit RJS-1, and the Forest Practices Board Manual, exhibit RJS-2). These would require road design and construction practices similar to a backhoe type excavator shovel transferring soil and debris to a dump truck for disposal in a stable location. Disposal sites within 100 feet of natural waters could cause significant sedimentation. Mitigation measures for spoil placement states; placement will not be closer than 10 feet of the ordinary high water mark (Page C-18 paragraph 3, App. No. 96-1). Drainage structures must be designed to limit sediment movement and placed so they direct water onto the forest floor not directly delivering into natural channels.

Permanent forest roads are commonly 10 to 20 feet in width with a disturbed area (road prism) comprised of the fill and cut slope being 20 to 50 feet in width. The road surface is generally a rock ballast (>6 inch rock) from a local rock source near the segment of road. Temporary roads are generally 8 to 10 feet wide with a road prism of 15 to 30 feet in width. The road surface is generally native material from onsite.

Q : What are the important factors with drainage structures (drainage devices - such as culverts and bridges) and control (drainage techniques - such as road outsloping and water bars)?

A: No permanent road construction or maintenance is proposed by App. No. 96-1. Forest Practice rules require all permanent drainage structures maintained and designed to pass fish when present, a minimum of 50 to 100yr storm flows, and have armored (non erodible) inlets/outlets.

Water moves through disturbed material and sand/gravel more easily than through material in a natural state. The disturbance along the construction area must have in place strategies to control water movement that maintains natural drainage patterns. The trench caused from construction will collect subsurface flows and depending on the exit, these flows could generate large soil movements. Placement of drainage structures or controls in the rain on snow zone should not exceed 300 feet in horizontal distance or 20 foot elevation changes. Similar distances should be considered throughout the App. No. 96-1. Limiting the number of culverts/ditches and requiring outsloping with drivable water dips remedies many of the natural drainage pattern changes and associated sediment delivery issues.

Q : Should we limit the amount of exposed soil during construction activities?

A: Revegetation on exposed soils is proposed within App. No. 96-1. Exposed soils from construction have the potential to cause significant sedimentation to streams and wetlands. Revegetation within the first growing season which extends from March thru October can reduce this potential by approximately 400%. When disturbance occurs

within 100 feet of streams the opportunity to deliver large amounts of sediment exists. Seasonal construction requirements should be applied within these areas.

Q: Why is slope stability affected by roads and construction activities within the pipeline corridor so important to address?

A: Masswasting (earth slides) have the potential to deliver large (more than 50% of natural background level) amounts of sediment to streams. Land slides have many issues and are covered in separate testimony from Susan Shaw. Steepness of slope determines the risk of soil movement in most cases. Much of this can be controlled by limiting the extent of disturbance and is not totally solved by engineered site design. Slopes over 50% have a higher potential to impact resources than lesser slopes.. Slopes over 80% should be avoided because of the likelihood of mass wasting. Continuous slopes above water or within stream draws are the most critical because of 100% delivery potential. No perched soils (sidecast) should be permitted within stream draws and on slopes >50%. Temporary roads are a preference and placed back to a natural state following use. Road sections on slopes exceeding 50% should be constructed and maintained to minimize exposed soils and reduce sediment delivery to streams. These sections should also be designed to ensure proper location and minimize road prism construction widths..

Q: What is sidecast and what resource issues does it create?

A: Forest Practice road construction and maintenance rules (WAC 222-24) require the removal of sidecast with a potential to impact public resources on slopes generally over 50% and within unstable areas. Sidecast is the placement of soil to create part of the road

surface or wasting surplus excavated materials on slopes adjacent to the road. This creates a perched potentially unstable condition on the slope. Pull back all sidecast material on all slopes over 50% , areas within stream draws and those areas having stability issues. Revegetation is necessary and operational limitations should apply similar to the slope stability section above.

Q: Does road surface and construction drainage have the potential to deliver significant amounts of sediment to streams?

A: Yes. Water from the road surface or construction area is a major contributor to in-stream sediments. Roads have been identified and recognized as a main contributor of sediment to streams. The first two years following construction is critical due to disturbed and exposed soils. Forest Practice Rules (WAC 222-24) require the management of drainage so there is limited direct delivery of sediments to natural drainages. Surface runoff must flow across undisturbed ground at least 100 feet before entering natural waters to minimize sedimentation. The placement and interval of drainage structures has a potential effect on initiating land slides and in stream hydrology changes.

Q: What wetland functions are affected by road construction and associated disturbance.

A: Road construction activities within these areas affect soil compaction and natural drainage patterns. Limiting operations to temporary roads and the dry seasonal period will reduce compaction and minimize changes to natural drainage patterns. Filling within the wetland would cause the most significant impact to resources.

Q: What areas within road maintenance should landowners/operators concentrate on?

A: Cuts and fill sections have the highest potential for significant one-time events but road segments with drainage ditches have the highest frequency of recorded resource damage issues. Road maintenance needs to address both of these issues in a manner that prioritizes the maintenance needs based on estimated sediment delivery potential. Due to the complexity of road influences on public resources the rules are outcome-oriented. The descriptive words of “functional ditches and culverts”, “minimize erosion,” and “not conducive to accelerated erosion” are used in the rule to describe how a landowner will meet the road maintenance requirements.

Many road segments are minimal risk to public resources. Road segments with a deteriorating surface, drainage that delivers to natural stream channels or non functional drainage structures, must have maintenance accomplished to minimize resource damage. Abandonment of roads and reclamation of construction sites must reestablish natural drainage patterns, slope stability and ground cover with barriers designed to limit or eliminate vehicle and off road access.

Q: What landscape related road and construction issues exist?

A: The Keechelus/Mosquito Watershed analysis identified roads and hill slope disturbance as an issue within these basins (See attachments and maps for location within Nancy Sturhans Testimony). These recommendations are concepts which a landowner or operator could apply across the landscape:

- Sediment delivery is likely to occur if harvest operations that disturb soil occurs within 25 feet of streams.
- Operations within the slopes of a natural drainage would likely cause sedimentation.

- Road surface and drainage issues exist within the basins. Sediment delivery to natural drainages is presently occurring from road surface runoff.

Q: What does this mean?

A: Road and construction operations within unstable slopes (Refer to Susan Shaws testimony on slope stability for definition and locations) must be evaluated for risks and engineered to determine if activities could occur with a minimal risk of resource damage. Exposed soils need revegetated immediately with seasonal restrictions established based on the proximity of natural drainages. Roads on slopes over 50% should be designed by a qualified engineer. A designed road ensures proper location, defines construction limits, includes considerations on vertical and horizontal distances, road width and all the environmental considerations mentioned above. Temporary roads should be abandoned reestablishing natural drainage patterns and limiting off road vehicle use. Permanent and temporary roads must be designed to deliver runoff to the forest floor, functional drainage structures and surfacing that will not generate fine sediments capable of being delivered to natural waters.

There will be sediment delivery to streams from road and construction operations. Construction to this degree will encounter unknown or unmapped sensitive areas. A few strategies or concepts as listed above would address these unplanned/unmapped sites and lower the exposure and risk to public resources.

Signature block:

I certify and declare under penalty of perjury under the laws of the State of Washington

Prefiled Testimony of Ronn Schuttie

Exhibit RJS - T

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that the foregoing is true and correct to the best of my knowledge and belief.

Signed at _____, Washington on this ____ day of February, 1999.

Ronn J. Schuttie